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ABSTRACT

The successful integration of ecology and social studies in this sixth grade program offers students a chance to become aware of themselves and their immediate surroundings, both in the classroom and in the community. This model and the suggested learning activities can be successfully adapted for use at any of the other elementary levels. Students in the project study natural, man-made, and social aspects of the world. Through the use of team-teaching, group activities, field trips, and community projects, students gain an awareness of important environmental concepts and become aware of their social environment. One problem encountered in this project is the advanced reading level of most of the materials on environmental education. However, many of the articles suitable for class use can be reworded in order for students to comprehend them. Sample evaluation forms and suggested supplementary materials useful in the classroom and in conjunction with field trips are included in the appendix. (Author/JR)

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AN ENVIRONMENTALLY RELATED PROGRAM FOR THE SIXTH GRADE

Betty Crippen

Sedro-Woolley Project Report No. 14
December 1971
U.S.O.E. Project No. 0-0848
Grant No. OEG-0-70-5039

Huxley College of Environmental Studies
A Division of Western Washington State College
Bellingham, Washington 98225

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TO THE TEACHER:

Presented here are ideas for multidisciplinary environmental education. The objectives of the ideas and methods suggested are clearly stated. The overall objective is to provide you, the teacher, with an aid in the development of your approach to teaching for and about the environment. These are not learning packages designed to be applied verbatim, but suggestions for ideas and methods that will enable you to develop learning packages. The contents of this report represent only the first treatment of the idea. It is published in this form in order that teachers may have an opportunity to experiment with it.

You will have to design your personal approach to environmental education. You are an environmental educator now, whether you realize it or not, because the environment is all around you and you are teaching about the environment that surrounds both you and your students. The state of the environment indicates that there is something wrong with the way in which you have learned to perceive and behave relative to the environment, and with the way you are teaching others to learn and behave in their environment today.

The ideas presented here are examples of ways in which you can incorporate environmentally beneficial learnings into your curriculum. The intent is not that you "add on" something specifically environmental to your curriculum, but that you incorporate environmental learnings into your treatments of the subject matter with which you have already been dealing. The specific manner in which you treat your responsibility to

educate for environmental stewardship is up to you. It is hoped that these and many other ideas will help you in your effort to understand the meaning of "environmental education" and its implications for you as a teacher and as a human organism.

The environmental education development project of which this report is a part is an ongoing one, and it is hoped that all who attempt to use the report will participate in the project by reporting the results of their efforts to the project staff. The staff will compile the ideas and methods collected. This will enable all working on the development of environmental education to share each other's work and will promote the spirit of cooperation essential to the success of any project as broad as this one.

Please report the methods and results derived from your use of this report to:

John Miles, Director
Environmental Education Project
Huxley College of Environmental
Studies
Bellingham, Washington 98225

Thank you.

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AN ENVIRONMENTALLY RELATED PROGRAM FOR THE SIXTH GRADE

INTRODUCTION

Environmental education is increasing awareness in the students of the world in which they live. It is stimulation of their curiosity so they will seek out the answers to their own questions. It is making them use their noses, ears, and mouths as well as their eyes. It is letting them decide how they want their world to be in the future.

If we as educators can accomplish any one of these goals, then we have started to make education worthwhile to the students. The "things" a child studies must be real to him. Learning can be exciting and fun for the students, but we must supply the stimuli so that it can be.

Students that have some voice in what they do are more interested in how they do it. This year I tried letting my students have more control over their classroom situation. When I started my environmental project, I explained to the students what I was trying to do this year and that they would play a very important role in my project. After some discussion we voted to divide the project into a three-part study: natural, man-made, and social aspects of our world. "Natural" consisted of anything in nature that man had not made or altered. "Man-made" was any material or function that man had converted to his own use. "Social" was the interaction between people, whether at school, play, home, or work.

The class then divided into three groups, each group working on one of these topics all year. (While each group had its own special topic, the whole class concerned itself with all three topics at various times.)

I found that experts were needed in my environmental education effort since I was not familiar with all of the different concepts that I wanted to present to my class. I therefore incorporated team-teaching as a definite methodological feature of my program. I worked with several different teachers at different grade levels, and obtained a broader scope of the educational sequence as a result. I was more challenged in a team-teaching situation to perform at the best of my ability than if I had been left to my own resources. In addition to the inputs of the team, the use of oral reports given by members of the high school biology class gave my students much resource material that they could not have obtained themselves because of their reading level. The students became more involved because of the sharing of ideas that went on between the different age groups.

Most of my program this year was aimed at awareness of the self and one's immediate surroundings, whether in the classroom or in the community. I hope to deal more with specific environmental problems and possible solutions as the second phase of my program for the coming year.

As to the matter of learning space, of educational environment, I definitely felt the need for a large open area when we had the classes together, and also for small cubicles where groups could work without interruption. Small groups of seven to fourteen students were used for almost all classroom work and field experiences. In some cases one teacher concentrated his efforts with one group and the other teacher had the rest of the students; at other times the teachers just supervised the group work. I also used my high school aides as group leaders on field trips.

An attempt was made to use field experiences that could take place within walking or bicycling distance of the school. These close-in trips were very successful and the students seemed to gain as much from these trips as they did from our longer bus trips. I do feel that our trips to Seattle and Agassiz were worthwhile, because most of my students had not experienced either a foreign country or the downtown section of a large city. I am convinced that students need to know more about their own communities and way of life than they do now, and these field trips were one way to point out contrasting ways of life.

My program is aimed at sixth grade, but many parts of it could be adapted for use at any of the elementary levels.

Though the three sections of the program frequently overlapped because of the interdependence of each section with the others, I have separated them in this report for easy reference.

ENVIRONMENTAL EDUCATION CONCEPTS

The following partial list of Robert Roth's fundamental concepts for environmental education* was a primary resource I used to build my program, and is presented here in order that the reader can refer to the conceptual basis of some of the activities that follow. These concepts were selected from the first half of Roth's list. Table I contrasts some traditional with some environmental education concepts.

*Robert Roth, "Fundamental Concepts for Environmental Management Education (K-16)," in Schoenfeld (Ed.), Outlines of Environmental Education, Madison, Wisconsin: Dembar Educational Research Services, Inc., 1971.

TABLE I

CONTRASTING CURRICULUM, ENVIRONMENTAL EDUCATION AND TRADITIONAL EDUCATION

Environmental Education	Traditional Education
1. Focal point is on local places and issues that are "real" to students.	1. Subject matter is all-important; not related to the student.
2. Subject matter facts are a means to the goal.	2. Subject matter facts are the goal.
3. Strives for educated, useful citizens in long-range planning and goals.	3. Solves immediate problems related to a discipline, without consideration of other disciplines.
4. Teacher supplies stimulus for thinking, not answers.	4. Teacher expects book response.
5. Curriculum is field-oriented: a. community resource people b. local trips	5. Curriculum is classroom oriented: a. standard textbooks b. teacher lectures
6. Deals with present problems--local, state, national, and world.	6. Deals with "simulated" and sometimes outdated thinking.
7. Student problem-active solution learning is employed.	7. Formal written reports are required.
8. Utilizes all talents of the staff through team-teaching.	8. Uses single teacher instruction.
9. Employs multi-cube structure --many learning areas of different sizes and purposes.	9. Uses a four-walled classroom containing all the students.

1. Living things are interdependent with one another and their environment.

2. The management of natural resources to meet the needs of successive generations demands long-range planning.

3. Man has been a factor affecting plant and animal succession and environmental processes.

4. Environmental management involves the application of knowledge from many different disciplines.

5. Modern man affects the structure of his environment.

6. Esthetic resources and recreational facilities of economic and non-economic value are becoming increasingly important in leisure-time activities.

7. Man has the ability to manipulate and change the environment.

8. A knowledge of the social, physical, and biological sciences and humanities are important for environmental understanding.

9. Social and technological changes alter the interrelationships, importance, and uses for natural resources.

10. There are certain risks taken, and limitations experienced, when manipulating the natural environment.

11. Resource depletion can be slowed by the development and adoption of alternatives.

12. Environmental management has effects on individuals and social institutions.

13. Man's need for food, fiber, and minerals increases as populations expand and levels of consumption rise.

. . . . . .

Management Techniques

18. Increased population mobility is changing the nature of the demands upon some resources.

19. Options available to future generations must not be foreclosed.

20. A variety of institutional structures are involved in planning and managing the environment.

21. Hunting regulations are useful in maintaining and restoring populations as well as in distributing the game harvest.

22. Multiple use is a practice in which a given land area functions in two or more compatible ways.

. . . . . .

24. Architecture can be one of the positively persuasive influences in developing a congenial environment.

25. Zoning is a practice in which land uses are prescribed based on value judgments regarding the needs of society.

. . . . . .

Economics

28. The economy of a region depends upon the utilization of its natural, human, and cultural resources over time.

29. Economic efficiency does not always result in conservation of a natural resource.

30. The distribution or location of resources in relation to population, technological and economic factors are critical to problems of resource conservation and use.

31. The political and economic strength of a country is in part dependent upon its access to domestic and foreign resources and international relationships.

32. Conservation policy is determined by the interaction of science and technology; social and political factors, and aesthetic, ethical, and economic considerations.

33. Conventional cost-benefit analyses do not always result in sound conservation decisions.

34. A sound natural resource policy is dependent upon a flexible political system, pragmatically appraising and reappraising policies and programs in terms of their effect upon the public interest and in light of scientific knowledge about the natural resources.

35. Consumption practices are constantly being expanded by our ability to produce and create wants and markets, which affects the rate of resource use.

36. Individuals tend to select short-term economic gains, often at the expense of greater long-term environmental benefits.

. . . . . .

40. Choices between needs (essentials) and wants or desires (non-essentials) are often in conflict.

. . . . . .

Environmental Problems

44. Safe waste disposal, including the reduction of harmful and

cumulative effects of various solids, liquids, gases, radioactive wastes, and heat, is important if the well-being of man and the environment is to be preserved.

45. Pollutants and contaminants are produced by natural and man-made processes.

46. Increasing human population, rising levels of living and the resultant demands for greater industrial and agricultural productivity promotes increasing environmental contamination.

UNIT: NATURE

Water

General Theme: There is a greater and greater demand for the existing amount of water.

Objectives:

1. To understand the extent to which the processes of nature and the activities of man depend on water.

2. To learn more about such processes as evaporation from water, soil, and vegetation surfaces; circulation of moisture in the atmosphere; physical controls on condensation and precipitation; and possibilities of human control of all these processes.

3. To learn more about the physical and chemical properties of water in relation to such things as growth of vegetation, chemical reactions between water and its environment, removal and disposal of waste materials.

4. To understand the principles controlling movement of water and circulation of dissolved and suspended materials in it, both in surface bodies of water and in soil and rocks.

Some Topics for Study and Discussion:

1. Where does my community get its water? Is the supply always adequate? Is the water of good quality?

2. What about other communities in the state? Is water supply a matter of serious or just ordinary concern in the state as a whole?

3. Are floods and soil erosion a serious problem? Are there residential and industrial areas that seem to be flooded every few years?

4. Is much water used for irrigation in the state? If not now, what is the trend?

TABLE

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NATURE UNIT:

Topic	Subtopic	Time	Subject Area	Activities
Water	Lakes Ponds Bogs River Sea	Fall (four weeks) Spring (four weeks)	Science Art Reading English Geography	Make chart comparing different water types. Map shoreline. Get samples of water. Write paper entitled "No Water for One Day."
Soils (See also land use in "Man-made" section)	Types Plant needs	Fall (two weeks) Continue at intervals throughout year	Science Reading Social Studies Spelling	List things found in soil sample. Collect soil samples at mile intervals in the district (or other set area). Plant same kinds of seeds in different types of soil. Plant different types of seeds in same kind of soil.
Rocks	Geographical emphasis Geological emphasis (basic rock types) Use or benefit	Winter (four weeks)	Reading Science Art Social Studies Geography	Make crystals. Make volcanoes. Make identifying kits. Tumble-polish rocks. Hold a school rock fair. Make a community display window.
Plant life	Trees Local plant life (edible and poisonous Sea plants	Continue throughout year with other studies	Reading English Art Geography Spelling	Collect and dry plants. Write reports. Identify plants. Grow plants (as above, in Soils).
Animals	Wild Domesticated Sea creatures	Fall (one week) Winter (one week) Spring (one week)	Science Social Studies Art English Reading Spelling	Write a report about an animal (using first-person). Draw animals. Make charts to show animal relationship to given areas.

II

OVERVIEW

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Roth Concept	Objectives	Method	Resources	Comments
1 2 4 3 7 10 18 46	Identifying causes of problems Proposing solutions Contrasting and comparing different waters	Field trips Team teaching Student groups Bicycle trips (for some studies)	Public Utilities Department (Public Relations) Corps of Army Engineers Port of Skagit County Zoning Commission	Best to go to the sea in Fall because of Spring crowds
2 4 12 13 18 46	Knowing the types of soil Becoming aware of different damaging methods Contrasting and comparing soil types	Team teaching in the classroom Field trips to gather soil samples Student groups Walking or bicycle trips	County Agent Agriculture teacher	Stress man's use of the soil
2 5 6	Identifying local rocks Developing an appreciation of rocks and rock structure	Team teaching Field trips to collect samples Student groups	Local Rock and Gem Club members	A rock sample kit is a must for the teacher. The Washington State Geological Rock Map is an excellent resource.
3 7 10 17	Identifying local plants Accounting for locations Showing interrelatedness to environment	Student groups Gathering trips Walking and bicycle trips Team teaching	Department of Natural Resources County Agent State Parks Department National Park Service	A basic book on plant identification is a must.
3 13 21	Showing interrelatedness to other organisms in environment	Student groups Team teaching	State Fish Hatchery State Game Department	Reading the Woods (Vinson Brown, Stackpole Co., 1969) is an excellent book to use. Part of the unit emphasizes domestic animals' problems and the care of pets.

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5. Is there much industrial use of water? How much of the water comes from wells? Are industrial water uses in competition with each other or with other uses?

6. Is there a comprehensive system of water laws and water rights in my state? Is litigation over water rights becoming more common?

7. Is there serious pollution of ground water in my location? To what extent do existing laws and regulations require maintenance of high standards quality of water from public systems? From private wells?

8. Can water problems be said to constitute a threat to the future economy of my community? Of my state?

9. Does my community and my state have long-range plans for meeting future needs for water supply and for control of floods and pollution? Are recreational needs for water adquately recognized in the plans?

10. How can a group contribute most constructively to encouraging scientific study of water resources and effective planning of water resources and water-related activities?

Activities:

1. Make a chart showing the differences between the various types of water resources.

2. Make a map showing the shoreline of each type of water resource.

3. Get samples of water from each source and compare them under the microscope.

4. Set up a model pond in the room (using the aquarium or a fish bowl).

5. Write a short paper on the theme "How much do daily activities depend on water?" (speculation).

6. Write a short paper or engage in role-play on the theme "No water for one day."

Some Field Trips and Speakers:

1. Visit a lake, bog, pond, river, and the sea.

2. Obtain a speaker from the local water company.

Outcome:

The students were very interested in the plant and animal life around the various water resources. They enjoyed using the microscopes

TABLE III

NATURE UNIT: WATER

Problem: Knowing Kinds of Water Resources

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	Classroom	Field Site
Teacher	Introduction: show movie, "Pond Life" (Encyclopedia Brittanica Films). Introduce book Pond Life (Gorvett, Penguin Books, Ltd., 1952). Invite school science people to help identify specimens.	Set up small groups of students. Assign each a specific problem.
Students	Gather collecting equipment (rope, fine net, holding and collecting jars) Make a collection jar with handle Construct charts of water resources. Study samples with a micro-projector and an eye lens. Set up a model pond, using aquarium and the samples collected at the pond.	Collect the following: a. microspecies b. large insects (from water or plants) c. eggs and larvae d. plants e. water samples f. soil samples Map the shoreline.

when we returned to school. They gladly brought in samples of their own to share with the class. Most were especially thrilled with the bog because they had never visited one.

By breaking the class into small groups, each assigned a given task, I had more time to help them and it seemed to reduce the discipline problems that arise in one large group situation.

Comments:

Another year I would use more local resource people than I did this year. I would also begin the unit by bringing in a couple of different water samples that they could compare. This would involve them at the very beginning of the unit. It is a good idea to actually visit as many water resources as possible, at different times of the year. (A small stream is a good possibility that we did not employ this year.)

Soil

General Theme: Soil is the main community resource. The way man uses soil is fundamental to the quality of his living and to the maintenance of a continuously satisfactory standard of living. Good soil requires good management.

Objectives:

1. To understand that man and animals depend upon soil.
2. To understand how soil is formed and used.
3. To learn that soil is damaged by wrong use.
4. To emphasize the need for proper use of the land as the basis for any permanent program of conservation.
5. To learn the value of some common soil and water conservation practices and why they are used.
6. To develop an understanding of the dependence of man and civilization on soil.
7. To understand that man's health depends upon the quality of the soil.

Some Topics for Study and Discussion:

1. Why and how the farmer takes care of his soil and how he maintains its content of humus and plant nutrients.
2. What the soil is made of--minerals, organic matter, air, water.
3. Kinds of soil in prairie, forest, and desert.

4. Resources of the community--when it was settled and how.

5. Land use capabilities--suitability for crops, pasture or range, forest or woodland.

6. Conserving range or pasture by limiting grazing to carrying capacity.

7. Government agencies (Federal, State, and local) and their responsibilities.

8. The difference between soil and dirt.

Activities:

1. Gather a sample of soil, pour it out on paper and carefully go through it, listing all of the different items found in the soil.

2. Gather soil samples from different locations in the district and compare them.

3. Plant different types of seeds in the same type of soil.

4. Plant the same type of seed in several different types of soil.

Some Field Trips and Speakers:

1. Visit an experimental station to see what is being done in this area.

2. Visit a farm during spring preparation of the soil for crops.

3. Invite the county agent into the classroom to speak.

Problems:

All 40 of the students in my class planted their seeds at the same time. It would have been better for small groups of students to plant seeds on a staggered schedule. Students were not very interested at first, but once their seeds began to sprout they got very involved.

Comments:

Planting seeds could be done at lower levels than sixth grade, but my students had not done this before. Bird seed is a good type of seed for fast growth, as are bean and radish seed.

Another possibility for this age group would be to start a plant in the fall and care for it all year, observing its growth in various stages.

Vacation schedules also have to be considered when the class plants seeds, or it will be necessary for the teacher to come to school to water plants, and the students may miss seeing some of the growth stages.

TABLE IV

NATURE UNIT: SOIL

Problem: How Is the Soil Being Used in This Area

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	Classroom	Field Site
Teacher	Bring in samples of local soil; use inquiry method. Instruct students how to collect soil samples without injury to area. Ask County Agent to speak to class. Bring in seeds to plant.	
Students	Phone or write owner for permission to collect soil sample; set up date. Feel, smell, and list items found in soil. Compare with other soil samples. Plant seeds in different soils.	Visit Courthouse to see soil map of county and ownership map of county. Select location for taking soil sample. Go on a field trip to collect soil samples and bring them to school.

Rocks

General Theme: There are three basic types of rocks, classified according to origin. All three types of rocks are constantly being changed by natural forces. Man is finding more and more ways to use these.

Objectives:

1. To understand that the earth is always changing because of natural forces.

2. To be able to recognize and group rocks according to the way they are formed.

3. To be able to explain that rocks are changed by water, chemicals, wind, and variations in temperature of the atmosphere, as well as by man.

4. To recognize and appreciate the gems of the rock world.

Topics for Study and Discussion:

1. Explain the three types of rocks: Igneous rocks, formed from hot, liquid magma which comes from below the surface of the earth; Sedimentary rocks, formed from natural deposits on the earth's surface which have become covered and pressed together; and Metamorphic rocks, igneous and sedimentary rocks which have been changed by the heat and pressure under the earth's surface.

2. What is one of the most common minerals found in igneous rocks?

3. What gives color to igneous rocks?

4. What is marble? What rock is changed by pressure and heat to make marble?

5. What happens to rocks when they are heated by the sun during the day? At night? What happens as a result of these temperature changes?

6. What happens to rocks in a stream or river? How does wind cause rocks to change?

7. How fast are rocks changed by running water and by wind?

8. The faster water is moving, the larger will be the pieces of rock it is able to carry.

9. Three ways in which rocks can be broken up are by peeling off in sheets or layers, crumbling, and shattering.

10. How has man used rocks? Which rocks does he use? Why?

TABLE V
NATURE UNIT: ROCKS

Problem: Kinds of Rocks and How They Are Formed

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	Classroom	Field Site
Teacher (Team teaching two classes together)	1. Present a rock map. 2. Bring samples of many kinds of rock to broaden the range of knowledge in identification. 3. Provide the room with sample kit of local rocks. 4. Bring tumbler and demonstrate how it works. 5. Show steps of polishing rocks.	
Students	1. Make crystals. 2. Make model volcano stalagmite. 3. Make stalactites. 4. Identify rocks for display. 5. Make wall charts for bulletin board. 6. Write a report to share with the rest of the class, on topic of how rocks are formed. 7. Make a private kit of local rocks. <u>Rock Show</u> 1. Students agree on rules and post them. 2. Make posters advertising the show. 3. Make entry forms and ribbons. 4. Set up area for show and accept entries. 5. Guide class through rock show. 6. Return rocks to participating individuals.	Find rock samples.

Activities:

1. Examine rocks at different stages of weathering.

2. Have students make crystals out of sugar, salt, and soda.

3. Have students make models of volcanoes, using plaster of paris with soda and vinegar for the eruption.

4. Make individual rock identifying kits for local rocks.

5. Tumble-polish rocks that students bring in a rock tumbler in the classroom.

6. Make jewelry out of the polished rocks.

7. Hold a school rock display fair. Use a member of the local rock club to judge and award ribbons.

8. Make murals or posters explaining how rocks are formed.

Some Field Trips and Speakers:

1. Go on a trip to gather local material to make an identifying kit.

2. Invite a club member of the local rock and gem club as a guest speaker.

Comments:

I tried throughout this part of the unit to describe rocks in terms meaningful to the children. Again, small groups of five or six are best for project work. The class really enjoyed the polished rocks. The noise of the tumbler for a month was worth it. Students liked sharing their rocks and appreciated them, even though they might not have known their exact names. I used a member of the rock club to help me with the regional names for given rocks. We also made a display for Education Week which was in a store window for the entire week. If at all possible, let the students gather their own local rocks. They are likely to find rocks that mean something to them this way. A Saturday field trip is well worth the time for this. It becomes a "special" trip.

Plant Life (Emphasis on Forests)

General Theme: Natural plant communities are valuable resources. They preserve soil, hold water, shelter wildlife, supply many materials for man's use and add beauty to the landscape. The use made of their products cannot equal or exceed their growth.

Objectives:

1. To be able to identify local natural vegetation if on a field trip or in the classroom.

2. To be able to recognize poisonous plants in the local area (and what part is poisonous).

3. To know which plants are edible in the woods in case of an emergency.

4. To be able to explain why forests are important to soil, water, wildlife, and man.

5. To see some of the wasteful practices of man, as well as the good practices, in relationship to the forests of our region.

6. To gain insight into and appreciation for our area, as well as take pride in it.

Topics for Study and Discussion:

1. What plants are poisonous and why?

2. What parts of which plants in this area can be eaten?

3. The importance of forests in reducing soil erosion, storing water underground, and furnishing a home for wildlife, as well as producing raw materials for man.

4. Are forests being wasted because of unwise cutting practices and the failure to harvest mature timber? Discuss fire and insects and their impact on forests.

5. Improved forest conservation includes improved management, better fire and pest control methods, and reforesting suitable land.

Activities:

1. Appoint teams to locate and identify different plants in the woods.

2. Collect and dry different plants of the region.

3. Have a "plant of the day" show, bringing in a different type of plant each day.

4. Write reports on the different wood products.

5. Identify trees around the school by their leaves and bark.

6. Do a "Study of a Rotten Log."

7. Collect samples of different kinds of wood. (Lumber yards can help and are usually quite willing.)

TABLE VI
NATURE UNIT: PLANTS

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Problem: What Role Do the Plants Play in Our Everyday Life

	Classroom	Field Site
Teacher	Show movie "Treehouse" (KING studios). Bring in plant books. Bring in different plant each day for students to identify, using inquiry method.	Divide the class into groups. Provide a task card for each group. Help in their identification of plants and trees.
Students	Research subject of plant use and problems faced by plants. Write reports. Use books and materials to help identify plants they are unsure of. Press and mount leaves.	Identify the plants and trees. Count the number of different plants in a given area. Collect leaves. Map the area. Pick up any litter lying around.

Some Field Trips and Speakers:

1. Visit local parks to identify plant types.

2. Visit woods for a study of the natural vegetation.

3. Visit the sawmill or lumber yard.

4. Invite Forestry or Park personnel to speak to the class.

Comments:

Students were interested in the different plants, showing off their knowledge gladly to the third and fifth grade students when we worked with them. When visiting the woods, the students benefited as much from their "free time" exploring trails, trees, and other plants as from our more formal sessions. The students showed their appreciation for this by being careful not to ruin the area for others. They were careful as well about personal safety rules. Most of the students felt that this visit to the woods was one of our more interesting trips as well as just plain fun.

Animals

General Theme: Wildlife plays an important role in the food chain and is, therefore, very valuable to man. The class will try to find out why some species of wildlife are becoming extinct and why the number of wildlife in some areas is decreasing so rapidly.

Objectives:

1. To understand that wildlife is valuable to the ever-changing balance of nature.

2. To explain why wildlife is valuable to man.

3. To know that fish and wildlife are being depleted.

4. To be able to identify local wildlife (and also sea life).

Topics for Study and Discussion:

1. Wildlife is an essential part of many food chains.

2. Pollination of many plants depends upon insects.

3. Dispersal of many seeds depends on birds and mammals.

4. Wildlife has value to man because of recreational and aesthetic needs.

5. There is an increased demand on the supply of wildlife (hunting and fishing).

TABLE VII
NATURE UNIT: ANIMALS

Problem: Is the Animal Life Being Extinguished by Hunting and Fishing Practices in This Area ?

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	Classroom	Field Site
Teacher	Movies: "Beaver Valley" "Sea Life" Discuss relationship that animals have to the rest of the environment.	Arrange for skindiver to bring up different sea animals.
Students	Develop their own diagrams showing animals' interrelationship, such as food chain. Research report on animals in the local area.	Collect water with insect eggs. Hunt for signs of animals. List animals and signs seen. Find out hunting and fishing laws of the local area.

6. Destruction of many natural habitat areas of wildlife.

7. Violation of laws by man and lack of public understanding.

8. What is being done in ways of fire prevention, forest cutting practices, stream improvement (review); and in artificial propagation, protective legislation, and predator control?

Activities:

1. Write a report on one animal and its habitat. Ask the student to write in the first person as though they themselves were that animal; tell about how they live in this region.

2. Make freehand drawings of animals.

3. Make a wall mural of all the animals found in a given area.

4. Make charts to show their relationship to the area (food chain).

5. Bring in water that has pond eggs in it and place it in a closed container to watch the eggs hatch. (This activity could also be done in the Water section of the Nature unit.)

Problems:

1. We did the animal drawings in charcoal and some of the students had problems because they had not worked in this medium before. Many lost interest because of smearing problems. We should have started with pencil and then perhaps tried charcoal after trying some simpler project with it.

2. Many of the students found an example of the food chain and copied it, rather than to try to be original.

Comments:

1. Students enjoyed playing the roles of animals.

2. One idea is to have the students actually pantomine their animal, to see if the other students can guess it.

3. Be sure there is a lid on the jar of pond eggs when they hatch!

UNIT: MAN-MADE ASPECTS OF OUR ENVIRONMENT

Social Services

General Theme: Certain people and institutions or organizations provide federal, state and local direct or indirect needs for a community.

Objectives:

1. To become aware of different types or services that are provided for the community and how they operate.

2. To build a hypothesis that seeks to explain why these services are provided.

3. To plan a compromise that will provide for the facilities of the services and future needs.

4. To realize the basic needs that are no longer provided by one's own self.

Topics for Study and Discussion:

1. What stores are in this area?

2. What is a factory? Which factories operate in this region?

3. How is the experimental station different from a farm? Are experimental stations necessary?

4. What are other ways of disposing of garbage? What does our community do with its garbage?

5. Are cemeteries necessary? Is there any way that this land can be reused?

Activities:

1. Role-play a hearing on the closing of a state institution in the community that provides a large payroll for the community as well as a desired service for the people of the state. (Since such a closure of a local state hospital is threatened, the children heard discussion of the issue.)

2. Draw sketches of the actual process of a tree to lumber by steps.

3. Hold a class panel discussion on garbage disposal.

4. Demonstrate how the different services interrelate by drawing wall murals.

5. Write a paper on the topic "If No Services Are Provided, What Must I Do Myself?"

Some Field Trips and Speakers:

1. Invite a police officer from the juvenile division to speak to the class.

2. Visit experimental stations, both in the United States and Canada.

TABLE

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Topic	Subtopic	Time	Subject Area	Activities
Social Services	Stores Hospitals Factories Experimental Stations	Good as a winter unit	Mathematics Social Studies Reading English	Role play closing of a business. Make wall murals to show interdependency. Trace tree-to-lumber process by steps.
Land Use	How used? Why? Good or bad?	Continue throughout year	Geography Mathematics English Reading Social Studies	Role play Island Game. Role play Sedro-Woolley land use. Map roads. Map land use.
Cities and Towns	Reasons for use of land. Services (Growth in or decrease?)	Continue throughout year.	Geography Mathematics Art English	Map blocks. Measure blocks. Count people and cars in a given area for a given time.

VIII

ENVIRONMENT: OVERVIEW

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Roth Concept	Objectives	Method	Resources	Comments
7 12 13	To learn types of services offered in this community. Building hypothesis that seeks to explain why services are offered.	Field trips. Role playing. Speakers	Chamber of Commerce Police Better Business Bureau	Visitation and speakers best for student's understanding.
2 3 4 5 7 13 10	To formulate a plan for a balanced use of the land. To see on the map how land has been used.	Team Teaching. Field trips.	Zoning Commission County Commissioners Tax Assessor	Emphasis on understanding the need for future planning.
7 13	To find out why cities exist. To identify some of the problems of cities. To compare towns and cities.	Team Teaching. Field trips. Small groups.	Mayor Council Police Chamber of Commerce Fire Department	Stress difference between land cities and water cities.

Comments:

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I wasn't able to do as much in this area of study as I had hoped to do. The students really worked on the role-play hearing of the closing of Northern State Hospital. Over half of them had parents or relatives that were employed there. Several students wrote to the Governor and shared their replies with the class. They conducted the hearing in a formal and serious manner. They continued to follow this event in the news and reported on it as the year progressed.

I felt that both trips to the experimental stations were excellent. Some students felt that they would like to enter experimental station work.

Land Use

General Theme: Land is not always used in the best way. The class will try to understand some of the problems involved in land use and why wise planning for future land use is so important and necessary.

Objectives:

1. To see how man has used the land.
2. To be able to hypothesize why certain land is used for certain things.
3. To formulate a plan for a balanced use of the land.
4. To try to understand the need for future planning and public awareness.

Activities:

1. Role play the Island game.
2. Map freeways and roads of the area.
3. Map land uses of the area.
4. Observe directions of settlement and traffic movement.
5. Role play the first person to settle in Sedro-Woolley.
6. "Buy" real estate from ads.

Some Field Trips and Speakers:

1. Visit a mountain or hill overlooking the area (Little Mountain).
2. Take a tour of the county or area.
3. Visit parks.
4. Invite a Zoning Commissioner to speak to the class.

TABLE IX

Problem: What Are the Needs of a Town or City to Support a Given Number of People?

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	Classroom	Field Site
Teacher	Set up situations: 1. People only on an island. 2. First group of people to settle Sedro-Woolley. Assign roles. Make up rules with class. Furnish books on communities.	
Students	Must plan: 1. Land use. 2. Water needs. 3. Services needed. 4. Zoning of community. 5. Garbage disposal. 6. Type of government. 7. Laws and their enforcement. 8. Type of education. Present "community" to class showing how it operates.	Talk to City Council members and police officers to find out some of the problems that must be handled.

Comments:

Half of the class worked on the Island game while the other half worked on the Sedro-Woolley game. Both groups did a good job planning their communities. The Island group had a harder time because they were restricted to a given area. This was a very broad concept. Some were able to understand the over-all picture but most of them had problems with the complexity of the over-all picture of the county and the way land was being used.

Cities

General Theme: Today's cities are in trouble. More and more people are moving out of the cities, creating suburban areas with the same problems of the cities.

Objectives:

1. To learn what comprises a city.
2. To recognize the problems of a modern city.
3. To understand some of the advantages of city life.
4. To compare and contrast a city and a town.

Topics for Study and Discussion:

1. Why were cities ever started? What role did the location play?
2. What are the "parts" of a city?
3. What are the advantages of living in a city? What are the disadvantages?
4. How does a city differ from a town?
5. How does a city obtain money? What are some of the money problems today?
6. What are some of the problems faced by the cities?
7. How are cities and towns alike?

Activities:

1. Map a block near your home and piece together a map of the town.
2. Make a chart comparing towns and cities.
3. List all of the businesses in your town or city.
4. Measure a block by pacing it off.

TABLE X

Problem: How Important Is Any One Given Service to an Area ?

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	Classroom	Field Site
Teacher	Set up rules for role playing (closing of a business, Island Game, and Sedro-Woolley land use). Make sure each interested group or individual is represented. Appoint individuals for best results.	
Students	Read newspaper accounts. Work together to present each side of the problem. Study hearing procedures. Present actual hearing in class.	Contact community people for first-hand views. Listen to news reports on television and radio.

Some Field Trips and Speakers:

1. Invite the Mayor to speak to the class.

2. Visit downtown Seattle.

3. Visit downtown Sedro-Woolley.

4. Visit a tourist town, e.g., Harrison Hot Springs.

Comments:

Many of my students had not been to downtown Seattle, in the stores or on the streets. Because of the downpour on the day of our trip to Seattle, we did not make as many counts and measure the blocks as we did in Sedro-Woolley. I should have divided the class into groups as I had done for other projects.

UNIT: THE SOCIAL ENVIRONMENT

Communications and Getting Along

General Theme: Our ability to get along with others improves when we are are able to communicate and see other persons' points of view. Through communicating we can learn as well as teach.

Objectives:

1. To listen and understand what is being said.

2. To be able to express oneself clearly and easily before a group.

3. To try and help others when they are having problems in the classroom or on the playground.

4. To get along better with each other without arguing and fighting.

5. To be able to make choices using common sense.

6. To be able to work in a group in a constructive manner.

7. To be able to accept responsibilities as a member of our society.

Topics for Study and Discussion:

1. What is communications? Communicating is a two-way process.

2. What is your responsibility as a listening member of a conversation? As the speaker?

3. Do you actually understand what people are trying to convey to you?

4. What rules do you need to work together as a group?

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5. How can you constructively settle a dispute with someone?

6. What problems are students of your age faced with at home? At school? In the community?

7. What does self-discipline mean? Responsibility? Compromise?

Activities:

1. Role play "Listener and Speaker" (one-minute time limit). The teacher tells the class to divide into pairs without talking. Then, still without talking, pairs decide who is "A" and who is "B." As Step 1, A talks about anything for one minute. B listens, but can make no comment. B must keep his face expressionless. Stop at the end of one minute. The teacher then gives the class two minutes to write how they felt. The roles are then reversed; that is, B talks and A listens. Again, have them write their reactions. In Step 2, A talks. B can respond other than verbally; that is, with facial expression and body language. Then A listens, responding similarly. Have them write their reactions. In Step 3, the pairs carry on normal conversation for two minutes. Have them write their reactions. Then have the class discuss feelings and the need for communication.

2. Play the "Paraphrase Game." A talks. B repeats what A said, using different words, to make sure he understands what A said. A may interrupt B if he isn't saying the same thing A said.

3. Solve a playground problem as a group and abide by the decision made.

4. Role play holding an opinion other than one's own, to better understand another viewpoint.

5. Work in committees and groups for class projects.

6. Write journals of feelings and reactions to school, and especially to the classroom.

7. Hold weekly sessions to summarize the events of the week and to find out what the students thought was good or bad.

8. Choose where to sit in the room, changing positions when one feels like it.

9. Choose two or three different activities, to be taught by different teachers once a week.

10. Discuss allowances, chores, and other related subjects.

11. Each one teach one. This activity may be done at any grade level. Each student prepares one lesson to teach to another student. I used my sixth graders with third, fourth, fifth, and other sixth graders. The sessions are on a one-to-one basis. The teachers are there to help if a student gets stuck, but the teachers tried (as much as possible)

TABLE

SOCIAL UNIT:

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Topic	Subtopic	Time	Subject Area	Activities
Communications	Listening Understanding Speaking Writing	Continue throughout year.	English	Role playing. Paraphrasing. Self-discipline. Group work.
Job orientation to area	Natural Resource jobs State-funded jobs Service jobs 1. Wants 2. Needs	Winter unit	English Social Studies	Interview parents about their jobs. Research desired job.
Recreation	Leisure time Outdoor orientation Clubs Youth programs	Continue throughout year.	Physical Education English Reading Mathematics	Trail hiking. Bicycle trips. Oral reports. Catalog shopping for equipment.

XI

OVERVIEW

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Roth Concept	Objectives	Method	Resources	Comments
5 19 7 13	To solve own problems. To understand other viewpoints. To be able to express problems and formulate opinions	Class dicussions Each-one-teach-one	High School Counselors Psychologist	Avoid trying to solve student's personal problems in a class discussion. Need one-to-one relationship for that.
12 9 19 20 4	To define job bases. To analyze the evolution of the job base for this area.	Field trips Speakers Class discussions	Employment Office Summer Job Corps Migrant Center	Don't compare the economic aspects of jobs. Emphasize the useful service that each job provides.
21 30 22	To identify mass population's needs for planned areas. To identify reasons for recreations.	Field trips High School Biology students Class discussions	Hiking Club	Do not criticize any one type of recreation.

to be merely observers of what was taking place. This is really a good exercise for slower students as long as their "helpers" are also slower students. To solve this problem of matching individuals, the other teachers from other grades would give me a list of their students, listing each student according to his ability. I would then assign my students accordingly; this planning helped a great deal.

Speakers:

1. Invite the school nurse to speak to the class.

2. Invite a school counselor (if available) to speak to the class.

Comments:

This section was the hardest to judge as to results, because one day everything would go well and I would feel that I had finally reached the students on the importance of getting along. Then things would fall completely apart. The students did make progress in settling their problems more peacefully, but still have a way to go. Some still do not listen any better, and continue to complain and argue about and with one another. I know that this class is not a typical sixth grade class, so I feel that with another class I might have more positive results.

The class did make up their own rules for every field trip they took this year. All of the students abided by these rules, which I felt was an accomplishment for many of them.

The each-one-teach-one activity was very successful with each class that tried it. All of the students that we worked into this project seemed to really enjoy it. The younger students enjoyed the activity as much as my class; I plan to try this in the primary grades next year.

Job Orientation

General Theme: Sooner or later most of us will be looking for a job. We should be aware of the fact that kinds of jobs vary from area to area and that many jobs require special knowledge and training.

Objectives:

1. To know what jobs are available in this area.
2. To understand the relationship between the type of jobs and the location.
3. To be aware of what their parents do to earn a living.
4. To start them thinking of possibilities for themselves.
5. To be able to explain what types of services man requires.
6. To realize the differences between jobs that offer needed services (police) and jobs of wanted services (beauty operator).

Topics for Study and Discussion:

1. What jobs are necessary to keep a school going?
2. What services do your parents provide to the community?
3. What other jobs are held in the community?
4. Which jobs are necessary to serve the people and which jobs fill wants of the people?
5. How do the jobs relate to the location of our community?
6. What jobs are available in other communities that are not needed here?
7. What do you want to do? What qualifications are required?

Activities:

1. Interview parents and report to class on their parents' jobs.
2. Research desired occupation. The reports can be either written or oral.
3. Role play a desired job. Have the rest of the class guess what the occupation is.

Speakers:

1. Invite speakers with different occupations (police, bus drivers, etc.) to speak to the class.

2. Have the class (in small groups of 14) visit different services in the community (bakery, greenhouse, newspaper, and the post office).

Comments:

1. The students were very interested in what the speakers had to say and had a good discussion with them.

2. While touring the different services both the students and employees enjoyed the smaller groups because then everyone could see easily and the speakers could be heard.

Recreation

General Theme: Healthy kinds of recreation are necessary for the well-being of people. Recreation offers an individual the opportunity to be free, to be creative, and to enjoy himself.

Objectives:

1. To realize that people have more free time to themselves than was the case in the past.

2. To understand the need for recreation that insures good health.

3. To be able to explain why people are more oriented toward doing things themselves.

4. To be able to identify types of healthy recreation from other types.

5. To gain insight into why man needs recreation.

Topics for Study and Discussion:

1. What types of recreation are available in our area?

2. What, if any, skills are required for participating in the different types of recreation?

3. What is the cost and time needed for any given recreation?

4. This recreation will fulfill what need within a person?

5. Does this recreation need any laws or changes to insure its continuation?

6. What recreation can be enjoyed by the entire family? Adults? Children? Does this area need to provide more recreation for the different groups?

Activities:

1. Have students give oral reports on any type of recreation that is now being enjoyed.

2. Do a community survey of types of recreation.

3. Catalog shop for recreational equipment for a desired sport or hobby.

4. Do some trail hiking.

5. Take a bicycle trip.

Some Field Trips and Speakers:

1. Invite a local hiking, clumbing or skiing club member to speak to the class.

2. Take a river hike or ride bikes.

3. Hike up old logging roads, hills or other areas within short range of the school.

Comments:

Hiking was very successful. There was interest in the possibility of starting some type of a Saturday program. Students were very interested in this area. They enjoyed sharing their personal experiences. Participation in the discussions was very good.

TABLE XII

A Comparison of the Traditional Earth Science Field Experience with Some Field Experiences in the Pilot Project

	Traditional Trip	Site Model Trips
Location	Relatively long distance from school; requiring travel time	Within walking distance of school
Accessibility	Inconvient because of travel time; usually limited to a single visit	Convenient for frequent visits
	Large areas	Small, well-defined areas
Operation and Activities	Time limit imposed	No strong time limit
	Instructor lectures to students	Student investigations
	To review and confirm prior knowledge	
	Limited kind and number of measurements and data recording	Variety of measurements
		Continuous observations
Observations	Emphasis on vast land and time spans	Recent events considered
	Concern about past, primarily the internal changes on earth	Concern for contemporaneous (primarily surficial) processes of change on the earth
	Man's effect on the environment not strongly considered	Man's role in environmental changes actively considered

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FIELD ENCOUNTERS

Room Description (one-half hour)

The students described the room as they saw it. Most of them gave physical descriptions. As the year progressed and we repeated this activity, their descriptions began to include how they felt about what they saw.

Open Lot Across from the High School (one-half hour)

We walked the three blocks to the lot. The students took notes on all of the things they saw, and picked up some of the litter at the site. Then we returned to the room and they wrote what they had felt. Some of the students wrote a physical description of what they saw; others expressed insight in going beyond mere description. Several of them did excellent papers.

Outside the School Building (forty-five minutes)

Each student picked out a plant or a tree and wrote a description of it without using its name, to see if the rest of the class could guess what plant or tree they were describing. Using the same plant or tree, they then wrote three questions about it. Then each paired off with a third grader. The pairs went to the chosen spot, and my students asked questions about the plant or tree to encourage the younger children to think about all aspects of the object. When they had finished, they returned, still in pairs, to the classroom. The third graders each wrote a report and drew pictures about what they had seen. My students helped them with spelling and punctuation. The third grade teacher and I were very pleased with the conduct and seriousness of both grades. The students enjoyed the activity and we engaged in several more similar projects during the year, using different subjects.

Photographs

Using photographs taken by Lee Mann, a local nature photographer, each student selected a picture and wrote about how it made him feel. Next, each student showed his picture to a third grader and they discussed the picture together. Then my students helped the third graders to write a story about reactions and feelings. We did the same thing with fourth and fifth graders. At the end of the project we compared the stories of the four classes. Some showed similarities, but most of them were completely different one from the other, showing students' individual responses to the photographs. All of the students did a good job and I was very pleased with the results.

Clear Lake Loop (one hour)

Leaving school on the bus, we first stopped by Good Year Nelson's ponds and discussed the early history of the Skagit River and the old river bed. Then we proceeded to the Skagit River itself. We discussed

the flood plain and also the different types of vegetation found along the river. We turned at the Francis Road, again pointing out the flood plain and talking about the water table. We saw the oxbow left by the Skagit River. Crossing the Nookachamps, we discussed the Trumpeter Swans which inhabit this area. Cutting over to the Clear Lake-Mount Vernon Road, we stopped to see where the glacier had carved its way through the hills. Enroute to Highway 9 we stopped at the gravel pit to show the students the layers of sand and gravel. We went back to Clear Lake School, where the river had once run. After our return to Central, the students mapped the route which we had taken; there were some very good results. Mr. Juntenan served as narrator on the tour and gave the students a lot of the early history of this area. Most of the trip was in the bus, but since it was only an hour long the students didn't seem to mind. This tour gives a good background of the Skagit River and the part the river has played in the settlement of this region.

Lake, Bog, and Pond Trip (two and one-half hours)

Our first stop was the Claar Lake fishing area. We saw the duck houses; Mr. Juntenan explained to the students why this lake was dying. Students gathered samples of water, leaves, and some eggs. We went on to the bog past Big Lake, where I divided the class into three groups. I worked with two groups on plant identification in a wooded area while the third group went down the hill with Mr. Juntenen to see, feel, and study the bog.

We then continued on to the pond that has a floating island in it. We were not able to get close to the island, as it is on the opposite side of the pond from our study site. We discussed the possibility of taking a small group out to the island in a canoe after school; we might try this next year. Students collected enough material so that we were able to have a model pond in an old fishbowl in our classroom. We were able to get a Sun Dew plant for each student. The students tried catching bugs to feed the plants for the rest of the day.

Sedro-Woolley

We walked downtown to the corner of State and First Streets, a four-way stop corner. Using a stop watch, the students counted the number of cars that passed in three minutes. They counted the number of businesses, and noted what types they were. They located the tallest building and noted the number of stories it had, and counted the number of buildings in the area that were three stories tall or more. They also counted the number of people who passed by in a three-minute period. Then they measured off a city block by stepping it off. Some of the students felt conspicuous, because people stopped to see what we were doing and some would ask the students about it. (We did not have this "problem" in Seattle for a similarly conducted exercise.)

In a three-minute period in Sedro-Woolley we saw 25 cars go by and 54 people on the street. This measurement was at about 2:30 on a Thursday afternoon. The students also listed the types of transportation they observed, and listed noises they heard. When we returned to the classroom we discussed the results.

Seattle

Our class went first to the Math section of the Science Center, after which we rode the Monorail downtown. None of my students had been on the Monorail, so they were really excited about it. Because of the pouring rain we did not measure off a block, but we did take the people count (250) and car count (150). I am not certain how accurate this count was, because the students were facing in different directions and counting, and then added their scores together. The count took place at about 1:30 on a Thursday afternoon. We next divided the class into small groups and went into the stores, making lists of things we saw that we didn't have in the Sedro-Woolley stores. The students rode an escalator (and also sat on Santa's knee!). On the bus, the students had field trip books in which to work. These books contained the rules the students had devised, some drawing paper and paper for notes, and lists of questions to which they would find the answers while in Seattle. They were also asked to list the towns between Sedro-Woolley and Seattle. We compared and contrasted Sedro-Woolley and Seattle when we returned to the classroom.

Saturday Trip

We took four sixth graders and four fifth graders to get an overview of the Skagit Valley; we intended to use these students later as group leaders on our field trips. We started at Central School and went first to Little Mountain to get a view of the valley--its geography and land use. We then drove through Mount Vernon to the freeway. We turned off the freeway onto the Cook Road, noting the farms and types of farming in the area. We then proceeded to a sand bar on the Skagit River, where the students built a fire and prepared lunch. After lunch we went to Baccus Hill, where we found some nice fossils. We visited Bingham Park, and ended our tour at Memorial Park so that we could compare the two parks. A small group of students, rather than the whole class, is ideal for this type of overall view trip.

Little Mountain

We took two classes--fifth and sixth grades--and divided the students into groups of twelve, six from each grade. Mr. Hillier had prepared a study of the valley from the tower, using a compass and field glasses. Mr. Juntunen had prepared a unit on "Study of a Rotten Log"; Mrs. Undt was in charge of a project to pick up glass which we later used in an art project; and Mr. Heberling handled a section on plant identification. I oversaw an art lesson, using nature's colors to draw

a picture. Since it started raining very hard we had to shorten the lessons we had planned in order to let all of the students attend each group session. We also allowed time for the students to explore some of the trails on the mountain. The wind and rain were very bad, but the students didn't complain at all. More time and nicer weather would make this a better trip. We were too rushed.

Occupational Trips

Taking seven sixth graders and seven fifth graders, we walked downtown as a group to one of the businesses. Meanwhile, Mr. Hillier worked with the remaining students on the subject of soil. During this time, the students remaining with Mr. Hillier planted seeds. The group of fourteen students, with their teachers, visited a bakery, a greenhouse, the post office, and the newspaper office. We arranged these visits so that each student would have a choice to make regarding the type of business we visited.

We went first to the greenhouse. On a subsequent afternoon, we took the next group to the newspaper. The first group then visited the bakery, and the last group went to the post office. Each group reported to the rest what they had seen on their tour. Mr. Hillier and I were both pleased with the results, and the students seemed to enjoy the smaller groups for the trips.

Memorial Park

We walked the three blocks from school to Memorial Park. I divided the class into four groups, giving each group a project to carry out.

Group One was to identify plants; Group Two was to note and list man-made alterations to the area; Group Three was to measure the park; and Group Four was to map the park area, including everything in the park. Each member of the class also wrote down their feelings about the park. We found Memorial Park a good location to use for a model site to visit in the fall and then subsequently about once a month, to view the changes that took place.

Bowman's Bay

We took two classes of sixth graders to Bowman's Bay. Mr. Juntenan did some skin diving, bringing up different types of sea life for the class to see. We divided into groups, with two groups studying tidal zones while another group visited the fish hatchery and still another group watched the skin diving operation. The students built a fire and prepared their own lunch. The afternoon was spent hiking trails, beachcombing, clam digging, and agate hunting.

Bicycle Trip

Only eight students showed up for this trip, since it was raining very hard. We decided to go anyway, and bicycled up the south side of the Skagit River to Gilligan Creek. The students built a fire and prepared lunch. From there we went up Old Day Creek Road, pushing our bikes most of the way. We left our bicycles at the home of one of the teachers and

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hiked up to Gilligan Falls, about five miles round trip. After picking up our bikes, we bicycled down to Clear Lake and back to Central. We got rather wet, but had a good time. The bike trips were ideal for actually getting the students outdoors to see things and to get a little exercise at the same time. I hope to do more of this next year.

CONCLUSION

I feel that this year has been one of my best teaching years. I spent about two-thirds of our class time on some aspect of my project. I found that I could completely incorporate writing, spelling, English, science, and part of the social studies curriculum into my environmental education project. I had trouble including math, but did find a few ways in which to do so. I can see that incorporating math into the environmental education curriculum means more work on my part. I also had some problems with reading because I could not find enough material written from an environmental education standpoint which was suitable to the ability of my students. Toward the end of the year I was finding more material, but I found it necessary to reword many articles in order for my students to comprehend them.

I devised an evaluation form for the students to fill out at the end of the year so that I could gain perspective on my project and plan for the following year. In this evaluation, 80 per cent of the students felt that this had been a good year because they had actually gone out to see and work with the things we discussed in class rather than just read about them. They also liked the continued involvement in a subject beyond the unit on it. They liked best working in small groups rather than having the whole class working on the same assignment, and they also liked being divided into small groups for field trips, with a special assignment for each group.

BIBLIOGRAPHY

BOOKS

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Very excellent charts that the students understand easily.

Craig, Gerald S., Science for the Elementary School Teacher. Boston: Ginn and Company, 1958.

Community interrelationship to the different science aspects spelled out well.

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Good book for the students to read and enjoy. Good ideas for discussions.

Syrocki, B. John, and Theodore W. Munch, Science for a Changing World. Chicago: Benefic Press, 1967.

Good nature units laid out for teachers.

Civic Education Service Staff, We Can Save Our Cities. New York: Scholastic Book Services, 1969.

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A little advanced for sixth graders, but they got some of the ideas through my reading and discussing the book with them.

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PAMPHLETS

"Our Polluted Planet," Ambassador College Research Department. Pasadena, California: Ambassador College Press, 1970.

Gives teachers some good material, but it is biased, and I don't think it a good idea to give it directly to students, at least at a sixth grade level.

"Guidelines for Environmental Sensitivity," Bureau of General and Academic Education, Pennsylvania Department of Education, 1970.

In a very few words this booklet suggests to the teacher what to look for in sensitivity to the environment.

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"Conservation, A Handbook for Teachers," A Cornell Rural School Leaflet. New York State College of Agriculture, 1951.

A good handbook for teachers to use on trips.

"Putting Conservation to Work." Portland, Oregon: Oregon State Department of Agriculture, 1965.

Outline format of material pertaining to conservation.

FILMS

"Pond Life," 11 minutes, B&W, Encyclopedia Brittanica Films.

APPENDIX

1. Supplementary materials for use in conjunction with field trips.

2. Materials for classroom use.

3. Some samples of student writings on various environmental topics.

4. Students' evaluation sheet.

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LEARNING TO KNOW NATURE THROUGH ALL OF OUR SENSES:
A PERCEPTION EXERCISE USED IN CONJUNCTION WITH A SLIDE SHOW*

Finding Nature's Treasures

By Bettye Breezer

(1)
Nature is that soft waft of a soothing breeze that tumbles your
(2)
hair about your face--it is the comforting tread of the rich brown earth at
(3)
your feet and the everchanging panorama overhead. To recognize the
(4)
"wood folds about us" should be to know our dearest companions, for what others offer such happiness and contentment as our acquaintances in nature?

(5)
Toss books to the wind and start from the beginning. That means using eyes, ears, nose, mouth, and hands to say "how-do-you-do" to new friends in nature. Let us offer a real "nature's treasures" program to you.

(6) (7)
Lying down on your back with hands folded under your head watching
(8)
the fluffy white clouds through a lace-like pattern of tree leaves is a "must" for the beginner. There's something in that relaxing intimacy with the universe you can't get in your everyday upright position. The
(9)
blue of the sky becomes deeper as you gaze and soon your imagination becomes aroused. Fluffy white masses take on strange shapes as you im-
(10)
agine you see sheep, castles and giants in your new-found view. Darting
(11)
birds provide the only interruption to your daydreaming, your first real introduction to the lovely archway of heaven.

(12)
The ground on which you have rested is worthy of your inspection. Turn over now and look around. The nearness of objects is perhaps a

---

*Numbers indicate representative slides reflecting the narration.

(13)
shock to your eyes--but there's beauty all about. If it has been grass you chose for your repose, take a look at it through a magnifying glass. A whole new world has opened up which you never knew existed.
(14)
And those creatures too small to be noticed before have come very much alive to you.

(15)
Dried leaves must not be ignored, for they offer a fascinating
(16)
study in shapes and sizes. And look for those scars--did you note that they are insect stings with little bugs often inside? Campers love to be told of such exciting things.

(17)
There's color in grasses--brown, dark greens, rose, and purple. It's much more fun to children to sit in the "Purple Field" than in the grass.

(18)
Rocks offer a challenge to those who enjoy finding color in the
(19)
out-of-doors. The "sandy" ones are fun to crumble, some to peel, "shiny ones" fun to use to reflect the sun. Shapes and sizes are interesting subjects to explore--and a well-weathered rock when split offers a fascinating study of design and content.

(20)
Too often fallen trees and old stumps are just something to rest upon or stumble over--in reality they are museums of life in the woods.
(21)
Peel off some of the rotting bark and see what scampers out. Hollow stumps may be fair hide-aways to the very young, but explore a bit to see what animal has used the spot for a "safe-deposit box." Little woodland
(22)
secrets of animal life are about you. Birds do not always build nests in trees. To examine bird nests is to marvel at the material they contain. How could lace, newspapers, horsehair, snake skins and thread be woven in such neat little parcels?

(23)
The use of the hands is important in the introduction of nature.
(24)
Feel a leaf for its smoothness or fuzziness, run your hands up and down
(25)
a tree trunk. Is it rough, smooth, shiny, pimply, jagged? Does it have
deep grooves or is it quite smooth? Will the bark peel easily? Does
(26)
it peel around or up and down? What leaves match the tree trunk you are
(27)
touching? Now stand back and observe the tree's shape. Can you compare
(28)
it to a vase, lollypop, teepee or all-day-sucker?

(29)
Some bushes and small trees have unusually aromatic flavors and smells. Crumple the leaves and smell them. Don't eat things that you are not sure you can eat.

(30)
A good rule to follow if you must collect: "never pick flowers
(31)
unless ten or more are in sight." It is far better to look and enjoy--and leave it for others. It is best not to pick things--especially in public parks.

(32)
From just the things you found in an hour's walk, would it be possible to set up a little woodland museum? There's the shiny bark, the
(33) (34)
cocoon, the many-colored fungus growth, odd-shaped twigs, and a frog.

(35)
Streams offer unforgettable adventure and rewarding reactions. It
(36)
is hard to say whether it's the steady flow of the water or the musical
(37)
note that soothes. Stop at a distance and listen. Turning a stream is a skill and enjoyed by all. One rock moved to another location in a dam arrangement can provide a distinct musical change.

(38) (39)
Sandy bottoms offer wide contrast to soft muddy ones. Thirsty little woods animals frequent streams and leave their footprints in the mud.

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(40)
Broken tree branches assume curious shapes--make a game of find-
(41)
ing jagged twig and limbs that may appear to look like bears' heads,
(42)
a letter in the alphabet, a woodland elf. Does that log or large rock over there look like an elephant, a bird, a woman's face?

(43)
A new name often makes a new friend--try calling the common dandelion a "golden paint brush." Did you know that the flower head contains many flowers? Examine it. By placing the split end of some flowers in water, they will curl.

(44)
Look for fairy villages. Could make-believe little people live in a small wooded area with small tree trunks for tables, rocks for chairs,
(45)
a hollow log for a bed? Sometimes kids like to make little make-believe
(46)
houses of things they find--little miniature villages, bridges, or lean-to houses.

(47) (48)
After exploration will come time for books and facts. Let's make
(49) (50)
it fun as we seek out information about nature and develop a real love of
(51)
the things around us.

STUDY SHEET USED IN CONJUNCTION WITH
LITTLE MOUNTAIN TRIP

Questions

1. What did you do?

2. What did you like about the trip?

3. What did you dislike?

4. What sessions did you attend?

Student Answer Sheet: Example

1. First Annette and I found Mister Juntunen and Then we went to the road and went on a trail and found a rotten log and he gave us a piece of paper and it had some questions on it and we did those one of them we had to look for a stump and we were looking and I found a well.

2. I just thought it was real pretty. You could see almost all the towns we went in the tower and it was real windy and there was a lot of trails.

3. The only thing I disliked was it started to rain and when I tried to eat the wind blew in my face so I had hair for lunch.

4. a. I went to Mr. Juntunen's class for rotting logs.
   b. And with Mr. Hillyer for math.
   c. And with Mrs. Crippen on this two mile trail.
   d. And Mr. Heberling.

The End

STUDY SHEET USED IN CONJUNCTION WITH
LITTLE MOUNTAIN TRIP

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Study of a Rotten Log

Would you believe . . .

that plants can live on and in wood? . . . That a rotten log is really alive?

All plants are born, grow to maturity, and die. They live in communities with many other plants in always-changing environments. With your class, go to a rotten log (or stump) and find out all you can about it. Take care not to tear it apart, so others can enjoy it, and so the living things in and on the log will still survive.

How did this log (stump) get here? _____

_____

Where is the stump (or log) of the tree? _____

What kind of tree was the log when living? (Look at bark and wood structure.)

_____

How did the tree die? (Notice stumps of other trees in area.) _____

_____

When did it die? (Determine age of standing tree in area.) _____

_____

How old was it when it died? (Count rings on stump if possible.) _____

_____

Record evidence of plants living on or in log (lichen, mosses, fungi, broadleaf and conifer plants):

Name	Location (top, side inside, under)	Seed Source	Effect on Log	Benefit to Forest Community

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What do plants need to grow? _____

How do plants get these things from the log? _____

Why do we call rotten logs "nurse logs"? _____

Record evidence of animal life in or on this log:

Name	Location (top, side inside, under)	Source	Effect on Log	Benefic to Forest Community

Why do they live here? _____

How do animals get these things from the log? _____

What will the log eventually become? _____

What things help to decay the log? _____

How does this log help soil hold water? _____

How does this log reduce soil erosion? _____

How does this log help new plants to grow in the plant community? _____

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How does this log illustrate the principle: "Matter is neither created nor destroyed, but only changed from one form into another"? _____

_____

_____

_____

_____

IDENTIFICATION SHEET

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_____ CATTAIL (Found in swamps; can be used as food)

_____ BRACKEN FERN (Fiddleheads, or new shoots, are edible in spring)

_____ SWORD FERN (Green all year; used by florists)

_____ SALAL (Green all year; used by florists)

_____ BOG LAUREL (Has a pink flower)

_____ LABRADOR TEA (Has a white flower; used to make tea)

_____ HOLLY (Evergreen; used at Christmas for decoration)

_____ SPHAGNUM (Damp moss)

_____ LICHENS (Found on dead trees)

_____ FUNGI (Important to rotting process)

_____ NURSE LOG (Dead tree may nurture its successors)

_____ NETTLE (Used to make fish lines and nets; edible when cooked)

_____ HUCKLEBERRY (Red berry; edible)

INFORMATION SHEET

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Poisonous Plants Found in Skagit County

It is not advisable to eat any plant--or parts of plants--that are not commonly known to be used as human or animal food.

Plants causing skin disorders:

Daffodil	Devil's Club	Iris	Poison Ivy
Primrose	Wild Carrot	Stinging Nettle	

Plants Having Poisonous Parts:

Plant	Poisonous Part
Azalea	Leaves
Bleeding Heart	Root
Bracken Fern	Mature Plant
Buttercup	Leaves
Cherry (wild)	Leaves
Daffodil	Bulb
Foxglove	Leaves
Elderberry	Shoots, leaves, stem
Holly	Berry
Horsetail	Plant
Iris	Underground stem
Ivy	Leaves
Lupine	Seed
Mistletoe	Berries
Narcissus	Bulb
Nightshade	Berries
Poinsettia	Leaves
Potato	Sun Burned
Rhubarb	Leaves
Rhododendron	Any part
Scotch Broom	Seed
Sweet Pea	Seed and stem
Tobacco	Leaves
Tomato	Leaves
Tulip	Bulb
Water Hemlock	Leaves
Yew	All parts

WORK SHEET, BOWMAN'S BAY TRIP

Draw and list all plants and animals found at each level. Describe ground cover.

1. Land level

2. High tide level

3. Low tide level

4. Water level

WORK SHEET

Study of Evidence of Animals

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In your chosen area, look for evidence that animals are or have been there. Look for things such as gnawings, tracks, droppings, dust baths, feathers, nests, hair, uneaten food, trails, holes, caves, etc. At the beach, look for shells, animal parts, etc.

Animal Sign	Animal That Made It	Sketch of Sign
Crab leg	Crab	
Shell	Butler Clam	
Feather	Seagull	

STUDY SHEET USED IN CONJUNCTION WITH
TRIPS TO AGASSIZ AND HARRISON HOT SPRINGS

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Animal Science:

1. Kinds of Dairy Animals on the farm _____

_____

2. What do dairy cows need in terms of vitamins and minerals? _____

_____

_____

3. Other notes _____

_____

_____

Poultry Science:

1. What effect does crowding have on hens? _____

_____

2. What increases efficiency of egg production? _____

_____

_____

Forage Agronomy:

1. What types of orchardgrass is being experimented on at Agassiz Experimental Station? _____

_____

2. What is corn being used for? _____

_____

3. Other notes _____

_____

_____

_____

Horticulture:

1. What two diseases that affect strawberries are being researched here? _____

_____

2. What is being done about vegetables? _____

_____

_____

3. Other notes _____

_____

_____

_____

Harrison Hot Springs

1. What types of land forms are there?

2. What types of travel are used here?

3. What type jobs are available here?

4. What type of recreation is offered?

5. Why is this town located here?

6. How do the physical features of the land affect this region as to jobs, way of life, and recreation?

INFORMATION HANDOUT TO PARENTS ACCOMPANYING CLASS ON SEATTLE TRIP

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What We Want Parents to Do

1. Decide where you want the students to go.

2. Point out (and encourage children to find) differences in the Seattle stores and our local stores.
   a. Types of stores that we might see in Seattle that we don't see in Sedro-Woolley
   b. Types of merchandise in the stores that we don't have in local stores.

3. Point out, and encourage children to note, types of people:
   a. dress
   b. nationalities
   c. ages

4. Encourage children to note and list types of vehicles:
   a. cars
   b. buses
   c. taxis
   d. bicycles
   e. trucks
   f. vans
   g. street cars

5. Keep students with you. Students stopping to look at something forget others around them. They can be easily left behind!

BOYS		MR. BRYAN	MR. CRIPPEN	MRS. EWING
Dan	Steve	1. Dave	1. Richard	1. Annette
Dave	Richard	2. Steve	2. John	2. Donna
John	Dale	3. Eric	3. Ray	3. Kris
Ray	Jeff	4. Dan	4. Dale	4. Susan H.
Eric	Ricky	5. Ricky	5. Jeff	5. Cindy
Darin			6. Darin	

GIRLS		LINDA	MRS. CRIPPEN
Val	Rosalene	1. Kathy	1. Rosalene
Teresa	Susan H.	2. Tina	2. Teresa
Rosie	Kris	3. Debbie	3. Val
Julie	Tina	4. Susan S.	4. Rosie
Debbie	Cathy	5. Julie	5. Shirley
Donna	Cindy		
Shirley	Susan S.		
Annette			

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The following are rules that the class made for itself for the field trip to Seattle:

Rules for Riding the Bus

1. No shooting rubber bands.
2. Leave other people's things alone.
3. No goofing off in the bus.
4. Share your seats with others.
5. No hitting.
6. No throwing paper on the floor.
7. Do not get mad at one another.
8. No using bad words.
9. No sticking your hands out of the window.
10. No sticking gum on the seats.
11. Do not move on bus or try to change seats.
12. Don't hang on to the side of the bus.
13. No screaming on the bus.
14. Keep all paper in the trash pail.

Rules for the Science Center

1. No gum chewing in the Center.
2. No running around.
3. No candy in the Science Center.
4. Don't stare at the hippies.
5. Don't hide anything from anyone.
6. Don't throw anything out the window.
7. No spitting at any time.
8. No wading in the fountains.
9. Only walk in the crosswalks when crossing roads.
10. No hitting anyone.
11. Have good manners.
12. Don't try to take money from the fountains.
13. Be quiet.
14. Line up in good lines.
15. No shoving.
16. Leave gum and candy on the bus.
17. Don't touch anything in the Science Center.
18. Stay with your group leader.
19. Listen to your leader.
20. Do not try to steal anything.
21. Do not slide on ice or snow if there is any.

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STUDENT WRITING ON VARIOUS TOPICS

After one of our neighborhood field experiences, I asked the students to list the items they saw at a particular site, to write about the things they saw, heard, felt, and to share with the class their reaction to the trip.

Empty Lot Across from High School

A lot of litter on the ground pop cans and other stuff. Pop cans such as coca-cola, sprite, orange, and others. There was a big maple tree past the sidewalk with no leaves of course. Then in front of the maple tree there was an old sidewalk real old it was covered with moss. As we were studying we could here the cars and then we could here the band practicing.

We also could see some old pants soaking wet. Then there was an old sandpit with trash in it. Then there was some salem and other cigaretts. Then there were some gum wrappers on the ground. Then theyre was some broken beer bottles on the ground. Theyre were some broken hose on the ground. Then there were some broken egsshells. Some rotten apples also. Lot of small rocks. Then theyre was some dog food can. Then their was a bike and stuff, others were sacks, cars, ball. I feel after we saw that we really have to clean it up.

At one point I suggested that the students choose a color and write an essay on it; at another I gave them various single words denoting aspects of nature and asked that they use it as their topic; and during the Social Unit I asked them to write about getting along together.

Red

My story is on red. My red is a bright exsiting color. Red is in lots of things like appels, houses and things like that. Well my red is in a fire. It isn't all red it has yellow and orange in it. I think

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red is most exsiting and beautiful when its in a fire. A fire isn't such a happy thing but it makes me feel good exspesaley the color. Think about don't you think red should be your color.

Wind

Wind is gentle in many ways, it makes the Beautiful flowers sway back and forth. And the trees so lonely until the soft wind blows through it's branches.

And wind some times is rough though it may cause hurricanes you should still love it with it's air filling the sky's. And if you have ever heard the wind swiftly rush through clanging chimes. Oh well thats Beautiful. Because to me it sounds like little pixie fairies dancing in the wind.

The End

A Friend

A Friend is a person you care for and that you like, and she or he likes you.

Most people have friends or just a friend.

Friends are very valuable like diamond, silver, or gold.

If you want to make a new friend you should be real nice, and play, and stay with your friend. Even when your mad & you hate each other for awhile, and then you make up, and think its really funny.

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I asked the students to keep "diaries" of our activities from day to day and to record their thoughts about their surroundings and activities.

Todays Diery

2/2/71

The only thing in the room I don't like is the wall murals. We should have the same kinds of things on the wall. These all don't match.

What I did like is the P.E. if we don't do excersizes. The pictures and story we had we should have them a lot more there fun.

2/3/71

I had Ricky Maywell for my student in Miss Sharan room. The each one teach one. He got one Hundred and drew an excellent picture of an filmingo. I like it very much!

2/4/71

We had a film about per-cent. I hated it. It was too facky. Some high schooll boys gave us an report about Eagals and swans and Candain goose.

2/8/71

We had two girls for an talking to about poullution. We had P.E. at 3:00 clock.

Feb. 2, 1971 - I liked every thing we did today, I like cleaning up the room the teacher was nice today. The teacher gave each girl a pass for cleaning up the room and her desk.

Feb. 3, 1971 - Shawn was a good little girl and she got a hundred on her test she's a good reader. I like doing these things with the third graders. and she minded real good.

Feb. 4, 1971 - Today was all right the teacher was all right she got mad at the boys. Boys came in to the room and gave a report about birds. Debbie sprained her fingers and had them all wrapped up.

Feb. 8, 1971 - Today was a very hot day. We have a lot of work to do this week. today I did some math and made up some math for the third graders, and also I studied my poem. Mrs. Crippen was alright today.

STUDENT EVALUATION

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DIRECTIONS: This is not a TEST, but some questions that I need to have answers for before I can plan for next year. What you write on this paper will not affect your grade. You do not have to put your name on it unless you want. PLEASE BE HONEST TELLING HOW YOU FEEL!

1. How did this year's school work compare to other years'? Do you feel you learned less, same amount, or more? Why?

2. Were the things we did interesting? If not, how could they be made more interesting for next year's class?

3. Did some of the things we did help you in getting along with others? If so, how?

4. What more needs to be done to help kids understand each other and adults better? What do the teachers need to do to help the kids more?

5. Was this year a "WASTE"? Do you feel that you would have learned more from the regular textbook learning? Should I go back more to the textbooks?

6. What does "environmental education" mean to you now? Would you like to see more or less of this approach used in your years to follow in school?

7. How can I be a better teacher? Do I have "favorites"? Am I unfair to the class or to individuals? Why? Please be truthful on this question because now is the time you get to evaluate me as I have evaluated you all year. What you say lets me know how I am doing as a teacher, so I can change (or at least try).

Student Evaluation, page two

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My "Report Card" - Please fill it in for me! Thank you.

8. What were the "good" things this year? What were the "bad"?